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10/074,003	02/14/2002	Warren Stuart Crippen	2207/12663	6656

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KENYON & KENYON  
1500 K STREET, N.W., SUITE 700  
WASHINGTON, DC 20005

EXAMINER

PATEL, ISHWARBHAI B

ART UNIT PAPER NUMBER

2827

DATE MAILED: 03/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/074,003

Applicant(s)

CRIPPEN, WARREN STUART

Examiner

Ishwar (I. B.) Patel

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 1-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-9, drawn to a method of manufacturing a space transformer, classified in class 29, subclass 830.
  - II. Claims 10-17, drawn to a space transformer, classified in class 174, subclass 250.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process such as the product does not need the etching step.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Shawn O'Dowd (Reg. 34,687) on February 27, 2003, a provisional election was made with traverse to prosecute the invention of a space transformer, claims 10-17. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-9 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

### ***Drawings***

5. The drawings are objected to because the figures are improperly cross hatched. All of the parts shown in section, and only those parts, must be cross hatched. The cross hatching patterns should be selected from those shown on page 600-114/115 of the MPEP based on the material of the part. See also 37 CFR 1.84(h)(3) and MPEP 608.02.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

6. The disclosure is objected to because of the following informalities:  
(I). "3b" on page 3, paragraph 00010, line 1, as used "the contact pattern of Figure 3b" does not seem correct.

Either it may be 3a or no reference numeral at all.

(II). "water" should be - - wafer- -, page 6, paragraph 00019, line 14.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 12, 14 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 12 and 14, the last phrase "the at least some of the electrically conductive material further defining the thermal contact zones", is not clear.

Any via filled with a thermally conductive material can be used as thermal contact zone, if required and is not clear whether the phrase is adding any structure other than the existing structure of via.

Regarding claim 16, it is not clear what is "means disposed in an inner region located between the first silicon layer and the second silicon layer".

Does it include the inner patterns only or the inner patterns and the connections on the top and the bottom?

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 10-12 are rejected under 35 U.S.C. 102(e) as being anticipated by.

Regarding claim 10, Van discloses a space transformer comprising:

a silicon medium (interposer body 12 made of ceramic material such a silicon, see figure 4, column 3, line 40-45; and

a predetermined contact pattern comprising electrically conductive material disposed in an inner region of the substrate and defining electrical contact zones located to provide double sided electrical contacts for the space transformer (contact pads 18 and 20 with conductive conduits 22, see figure 4, column 3, line 1-8).

Regarding claim 11, the body of Van further discloses a first and second silicon layer with contact pattern being disposed between the first silicon layer and second silicon layer, see figure 4 and 8A-B, column 4, line 60 to column 5, line 5.

Regarding claim 12, the body of Van further discloses the via with electrically conductive material into the via (see figure 4, column 4, line 1-5).

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Pham et al., US Patent No. 6,303,992, hereafter Van, as applied to claims 10-12 above, and further in view of Petrarca et al., US Patent No. 6,429,522, hereafter, Petrarca.

Regarding claim 13, the applicant is claiming an adhesion promoter disposed between the electrically conductive material and the first silicon layer.

Though, Van is not disclosing such adhesion promotion layer, as disclosed by Petrarca, it is known in the art to apply an adhesion promotion layer such as silicon oxide, silicon nitride, titanium, tungsten or related compound before a metal deposition. The adhesion promotion layer is often used as a barrier for metal migration.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the structure of Van with adhesion promotion layer, as taught by Petrarca, apparently in order to have better adhesion of the metal to the silicon substrate.

Regarding claims 14 and 16, the modified structure of Van further discloses all the features of the claimed invention including the adhesion promotion layer as applied to claims 10-13 above.

Regarding claims 16 and 17, the modified structure of Van further discloses all the features of the claimed invention including the contact pattern comprising electrically conductive material as applied to claims 10-13 above.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ma et al., discloses a silicon interposer with via holes along with two silicon substrates, see figure 2.

Kline discloses a wafer interposer with multiple layers with internal conductor, see figure 2.

Ahn et al., disclose silicon interposer with micro machined vias and electrical contacts.

Pierce discloses interposer substrate connected to wafer through conductive columns.

Wood et al., disclose a silicon substrate with conductive patterns, see figure 4.

Brofman et al., discloses a silicon interconnect structure.



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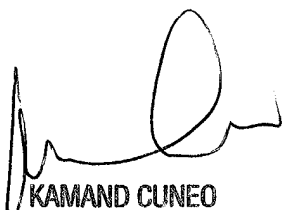
Rolfson et al., discloses adhesion promotion layer for photo resist on silicon nitride.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (8:30 - 5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (703) 305 9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3431 for regular communications and (703) 305 7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

ibp  
March 20, 2003



KAMAND CUNEO  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800